

What is claimed is:

1. A MOX fuel assembly for pressurized nuclear reactors wherein the assembly has a lattice arrangement in which one or more burnable poison
5 contained UO₂ fuel rods and a plurality of MOX fuel rods are arranged in an n-rows by n-columns ($n \times n$) lattice array , wherein said MOX fuel rods comprise at least two kinds of MOX fuel rods including a plurality of first MOX fuel rods and a plurality of second MOX fuel rods, and wherein each of the first MOX fuel rods has a predetermined Pu content and a predetermined Pu weight, and each of the
10 second MOX fuel rods has substantially the same Pu content as that of each of the first MOX fuel rods and a Pu weight different from that of each of the first MOX fuel rods.

2. The MOX fuel assembly according to claim 1, wherein each of the first MOX fuel rods includes a first cladding tube and a plurality of first MOX fuel
15 pellets that are confined inside the first cladding tube, each of the second MOX fuel rods includes a second cladding tube and a plurality of second MOX fuel pellets that are confined inside the second cladding tube, and the first MOX fuel pellet and the second MOX fuel pellet are substantially the same to each other in Pu content and in height dimension, but different from each other in pellet weight.

3. The MOX fuel assembly according to claim 1, wherein the burnable
20 poison contained UO₂ fuel rods are arranged in four corner locations of the lattice arrangement or in the four corner locations and its adjacent zones of the lattice arrangement.

4. The MOX fuel assembly according to claim 1, wherein each of the
25 first MOX fuel rods has a lower Pu weight than that of each of the second MOX fuel rods, the first MOX fuel rods are arranged in the peripheral zone or in said peripheral zone and its adjacent zone in the lattice arrangement, and the second MOX fuel rods are arranged in an inner zone inside the arrangement zone of the first MOX fuel rods within the lattice arrangement.

5. The MOX fuel assembly according to claim 4, wherein each of the
30 first MOX fuel rods has a first cladding tube and a plurality of first MOX fuel pellets that are confined inside the first cladding tube, each of the second MOX

fuel rods has a second cladding tube and a plurality of second MOX fuel pellets that are confined inside the second cladding tube, and the first MOX fuel pellet and the second MOX fuel pellet are equal to each other in height dimension and in Pu content and are different from each other in pellet weight.

5 6. The MOX fuel assembly according to claim 5, wherein the first MOX fuel pellet and the second MOX fuel pellet are different from each other in pellet diameter and/or pellet density.

 7. The MOX fuel assembly according to claim 5, wherein the first MOX fuel pellets and/or second MOX fuel pellets have one or more holes therein.

10 8. The MOX fuel assembly according to claim 5 having a lattice arrangement of 17-row by 17-column ($n = 17$) lattice array, wherein said assembly comprises four burnable poison contained UO₂ fuel rods arranged in four-corner locations of the lattice arrangement, respectively, sixty (60) first MOX fuel rods arranged in four peripheral zones in the lattice arrangement except for the four
15 corners thereof, respectively, two-hundred (200) second MOX fuel rods arranged in an inner zone of the lattice arrangement except for the four corner locations and the peripheral zones, one (1) first guide thimble for guiding incore instrumentation disposed in a center location of the lattice arrangement, and twenty-four (24) second guide thimbles for guiding control rods disposed in the
20 inner zone of the lattice arrangement in an almost evenly distributed configuration.

 9. The MOX fuel assembly according to claim 8, wherein four of the second guide thimbles are replaced with burnable poison rods each of which is composed of neutron absorption nuclear species without including nuclear fuel materials.

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ABSTRACT

This invention relates to a MOX fuel assembly for PWRs that enables satisfactorily suppressing a power peaking factor without the necessity of reducing the Pu content per fuel assembly. The MOX fuel assembly has a lattice arrangement in which one or more burnable poison contained UO₂ fuel rods and a plurality of MOX fuel rods are disposed in an n-rows by n-columns ($n \times n$) lattice array. The MOX fuel rod consists of at least two kinds of MOX fuel rods including a plurality of first MOX fuel rods and a plurality of second MOX fuel rods. The first MOX fuel rod has a predetermined Pu content and a predetermined Pu weight, and the second MOX fuel rod has substantially the same Pu content as that of the first MOX fuel rod and a different Pu weight from that of the first MOX fuel rod.